

## **CLAIMS**

1. A plate and tube bending device that is a plate and tube bending fixture forming die as well as a primary and a secondary clamp block that bends a workpiece into an end product having a predetermined angle of bend; the said forming die has a clamp surface and contouring plate workpiece forming surfaces, the clamping surfaces between the said  
5 forming die and the said secondary clamp block are utilized to hold the said workpiece, with the said primary clamp block also utilized to hold the said workpiece, the features of which are that the said primary clamp block consists of a clamp block mount, a cushioning mount, and a pressure cylinder mount, wherein:

The said clamp block mount has a containing room formed as an opening through  
10 it and a groove is disposed at the upper half portion in each of the two sides, enabling the said cushioning mount to fit in for guided sliding outside the said clamp block; spring mounts are situated in a parallel arrangement between two end plate outer lateral planar surfaces and the said groove bottoms, a screw is fastened to one end of each said spring mount to provide for hooking one extremity of a return spring, a notch is formed in each  
15 of the said two end plates at the other ends of the said spring mounts without the said screws, such that the said screws in the two side surfaces of a guide track mount protruding through the said notches outside the said two end plates facilitate the hooking on of the other extremities of the said return spring such that the said springs are positioned at the outer lateral planar surfaces of the said two end plates.

20 The said cushioning mount consists of the said guide track mount and a backing plate.

Threaded holes are tapped symmetrically into the two end surfaces of the said cushioning mount, screws are individually inserted through a check block and fastened into the said threaded holes position and at the same time, the said check block bottom  
25 surfaces make even contact against the said groove bottom surfaces, providing for the guided sliding of the said cushioning mount, a predetermined quantity of spring holes are arrayed in a set formation on the mount surface of the said guide track mount and circular holes penetrate the said guide track mount, a spring is placed in each of the said spring holes, and a predetermined quantity of circular holes in the mount surface of the said guide  
30 track mount and a predetermined quantity of threaded holes arrayed in a set formation along the rear surface of the said backing plate are all in symmetrical alignment, a

predetermined quantity of screws are upwardly inserted through the said circular holes from the bottom surface of the said guide track mount and fastened into the correspondingly positioned said threaded holes of the said backing plate, providing the entire said cushioning mount with shock absorbing capability to evenly vector applied force via the said primary clamp block to bend the said workpiece, and a guide track is formed along the two sides at the bottom surface of the said guide track mount which fits the inset guide slot of the said guide track slot mount disposed along the top surface of the said pressure cylinder mount such that the said cushioning mount has guided sliding capability.

10       The said pressure cylinder mount consists of a pressure cylinder, a connecting rod assembly, and the said guide track slot mount.

15       The said pressure cylinder has the said connecting rod assembly inserted into the rod head of its piston rod, a plurality of bearings and the said guide track slot mount are sequentially disposed facing upward on the upper end mount surface of the said connecting rod assembly, the said bearings are of wear-resistant, low hardness copper material construction that have durable and smooth guided sliding capability, enabling a large guided sliding surface capable of precisely forming tubing into the expected angle of bend and increase the service life of the pipe die, and the said guide track slot mount has the said inset guide slot that accommodates the said guide track formed along the two sides at the bottom surface of the said guide track mount, thereby enabling the conjoinment of the said pressure cylinder mount and the said cushioning mount.

20       2. As mentioned in Claim 1 of the plate and tube bending device invention herein, the said connecting rod assembly consists of paired connecting rod element assemblies, a long connecting rod block, a connecting rod mount, and a connecting rod guide element mount, the two ends of the said rod head of the said pressure cylinder piston rod are linked between the said pair of connecting rod element assemblies by means of an inserted pin, enabling said first pair of connecting rod element assemblies to be inserted in parallel at the two ends of the said rod head; one said connecting rod guide element mount is ensconced between the bottom ends of each said paired connecting rod element assemblies, the said long connecting rod block is ensconced between the upper ends and linked by means of the inserted pin, the said connecting rod guide element mount then capable of fitting into the two inner side guide slots along the lower half portion of the said clamp

block mount containing room; as the said pressure cylinder piston rod extends out and retracts in a guided sliding movement inside the said guide slots, the upper half portions of the said long connecting rod block ensconced between the upper ends of the said paired connecting rod element assemblies then projects on the said paired connecting rod element assemblies, facilitating the insertion and linking of pivot tabs protruding downward from all sides along the bottom surface of the said connecting rod mount to the said long connecting rod block by means of the said inserted pin.